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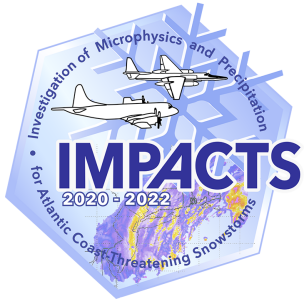
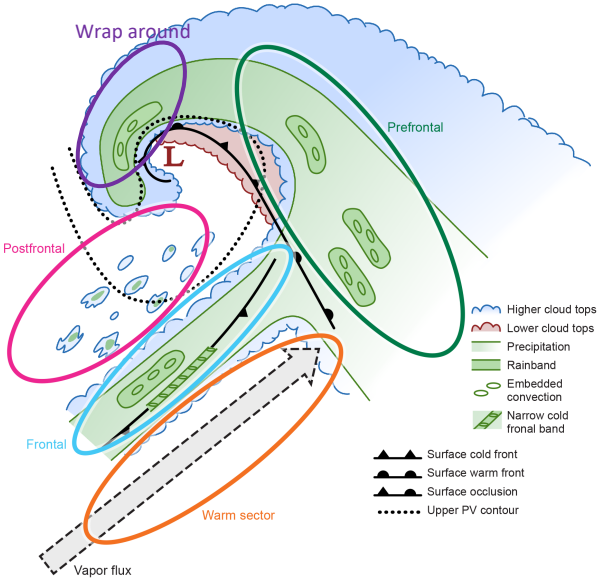
Precipitation Processes in Midlatitude Cyclones: Results from recent Field Campaigns

OLYMPEX: Precipitation processes in landfalling cyclones encountering a coastal mountain range

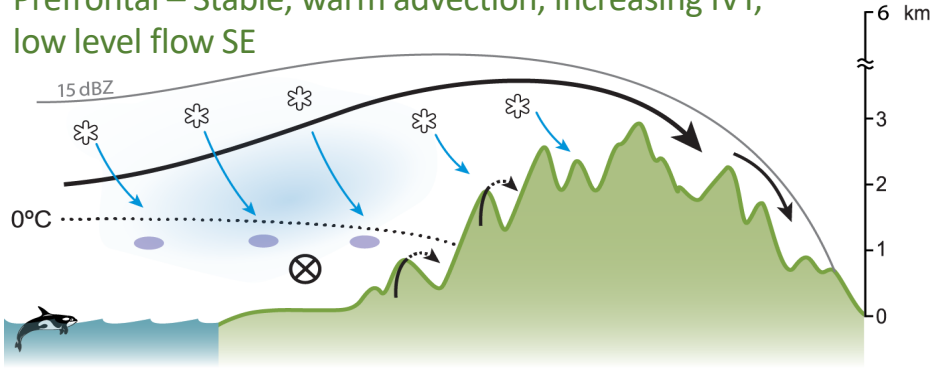


IMPACTS: Precipitation processes in East Coast snowstorms and their snowband structure



Lessons from OLYMPEX (Fall 2015 – Winter 2016)

Prefrontal – Stable, warm advection, increasing IVT, low level flow SE



Warm Sector – Moist neutral, high IVT, high melting level height, SW flow at all levels

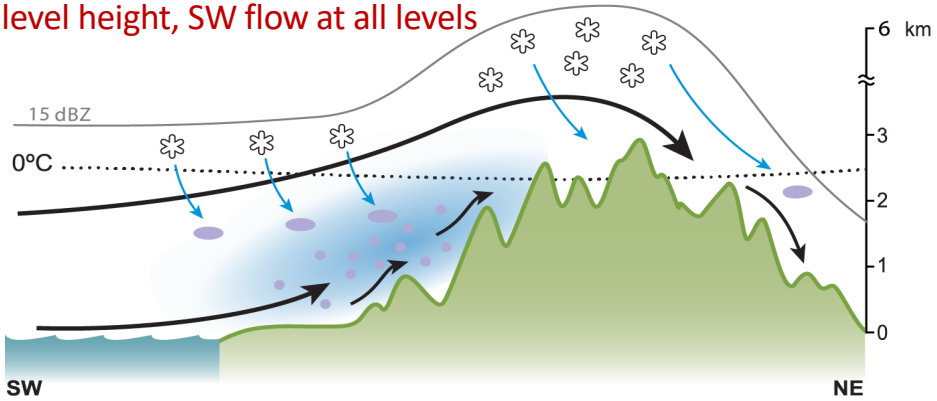
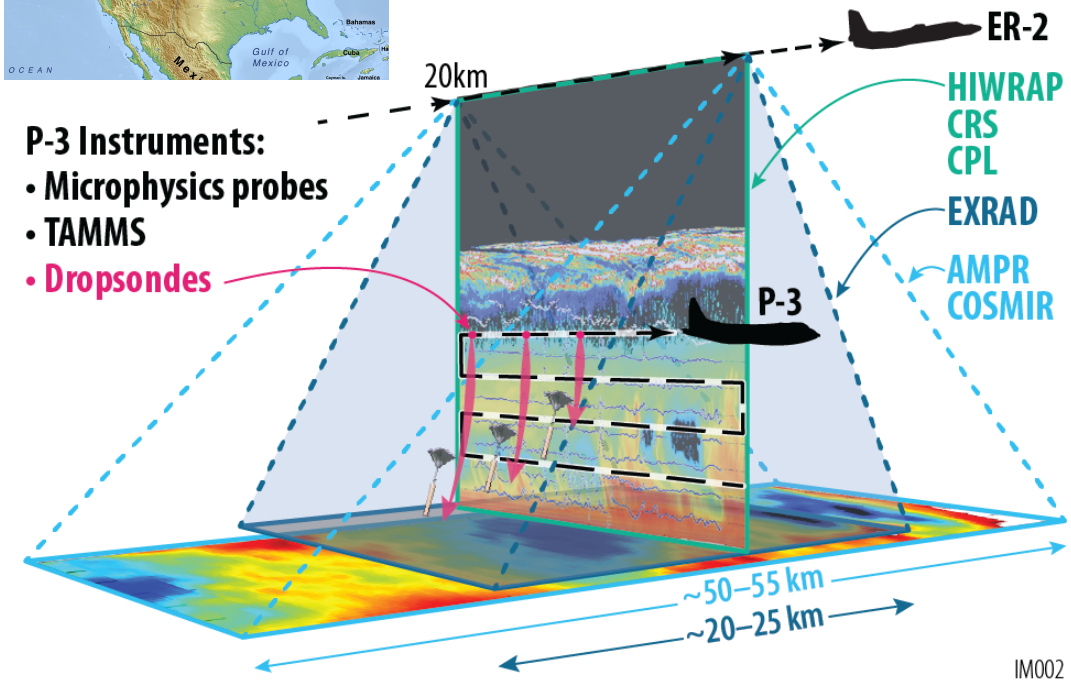


Figure from Zagrodnik et al. 2020, MWR, accepted

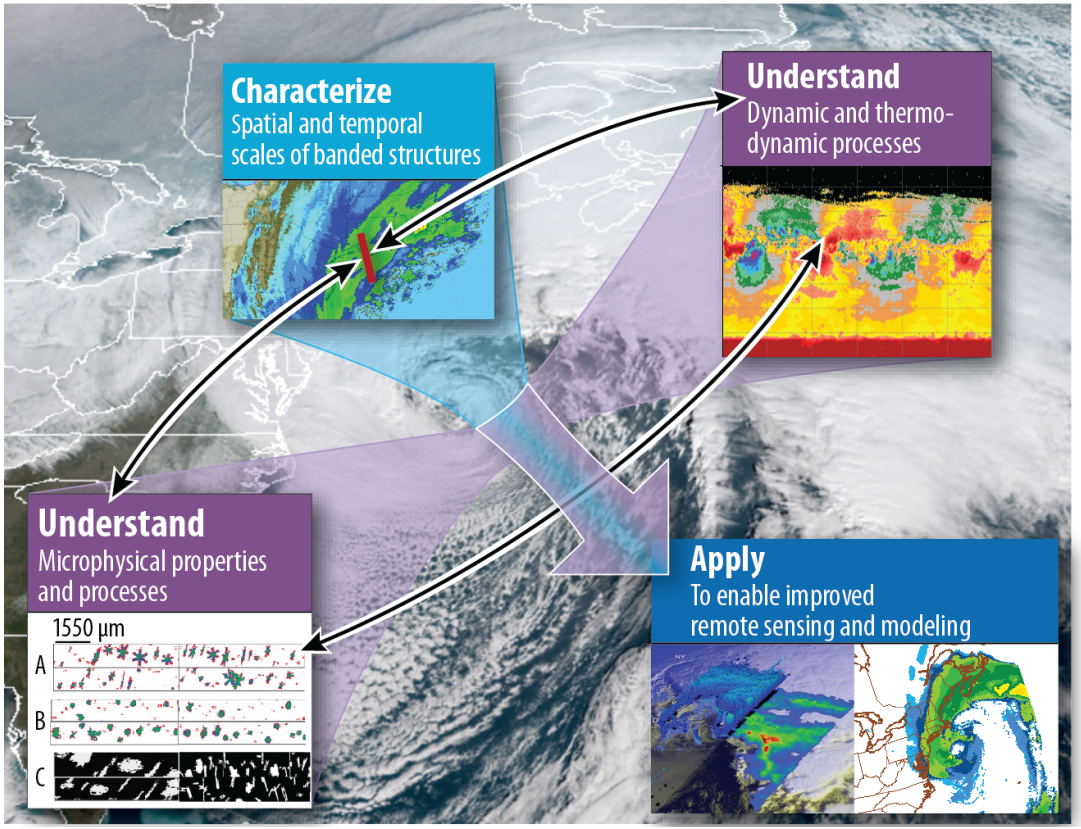
- **Precipitation processes vary with storm sector** and environmental characteristics (stability, IVT, etc.)
- **Ice processes are enhanced** (above the melting level) with flow is lifted encountering terrain
- **Warm rain processes important** (below the melting) on windward slopes during warm sector (atmospheric river) conditions
- **Numerical models underpredict orographic enhancement** due to inadequate parameterization of warm rain

IMPACTS (Winter 2020, Winters 2022 and 2023)



- **Field campaign sampling snow storms** with aircraft observations, frequent soundings, and ground radars
- **Coordinated observations** to relate remote sensing data to in situ microphysics

Lessons we hope to learn from IMPACTS (Winter 2020, Winters 2022 and 2023)



- **Field campaign sampling snow storms** with aircraft observations, frequent soundings, and ground radars
- **Coordinated observations** to relate remote sensing data to in situ microphysics
- **Observations will inform microphysics schemes** of numerical models
- **Improve prediction of snowfall rates and totals** in high impact storms